

Practical Thoughts

O N

AMPUTATIONS, &c.

BY R. MYNORS, SURGEON.

“Inter sanam vitiatamque partem incidenda scalpello caro usque ad os est sic, ut neque contra ipsum articulum id fiat, & potius ex sana parte aliquid excidatur, quam ex ægra relinquatur. Ubi ad os ventum est, reducenda ab eo sana caro, & circa os subsecanda est, ut ea quoque parte aliquid ossis nudetur: dein id ferrula præcidendum est, quam proxime sanæ carni etiam inhærenti: ac tum frons ossis, quam ferrula exasperavit, lævanda est, supraque inducenda cutis, quæ sub eiusmodi curatione laxa esse debet, ut quam maxime undique os contegat. Quo cutis inducta non fuerit, id linamentis erit contegendum, & super id spongia ex aceto deliganda. Cætera postea sic facienda, ut in vulneribus, in quibus pus non moveri debet, præceptum est.”

CELSUS.

B I R M I N G H A M :

PRINTED BY PIERCY AND JONES, FOR
G. ROBINSON, PATER-NOSTER-ROW, LONDON.

(1782)

141

T O
THOMAS KIRKLAND, M. D.

A S
A GRATEFUL MEMORIAL,

FOR HAVING RECEIVED

THE FIRST RUDIMENTS

O F
THE PRACTICE OF SURGERY,
IMMEDIATELY UNDER HIS CARE.

T O
WILLIAM WITHERING, M. D.

A S
A TESTIMONY OF GRATITUDE,

F O R
THE FAVOURABLE MANNER

I N W H I C H
HE HAS BEEN PLEASED TO SPEAK
OF THE PRACTICE HEREIN RECOMMENDED;

A N D T O W H I C H
OCCASIONALLY HE HATH BEEN AN EYE WITNESS;

T H E F O L L O W I N G P A G E S,
WITH TRUE REGARD AND ESTEEM,

A R E H U M B L Y A D D R E S S E D
BY THEIR MUCH OBLIGED, AND MOST OBE-
DIENT HUMBLE SERVANT,

R O B E R T M Y N O R S.

BIRMINGHAM, FEB. 4TH, 1783.

INTRODUCTION.

GRANTING all the praise, which is so justly due to several very respectable chirurgical writers of the present age, for their humane, and very successful endeavours, to dispense, in many cases, with the operation of Amputation; yet still, this very lamentable truth must be universally acknowledged, that in a variety of diseases, afflicting different parts of the limbs of mankind, this dreadful operation, still remains the only remedy to procure relief, or even preserve the life of the patient.

The necessity of this operation then being still admitted, will, I hope, in some measure, apologise to the candid practitioner,

itioner, for the liberty I take in humbly addressing him, with my thoughts upon this subject.

Amputation has, indeed, employed the attention of various writers, both antient and modern, and undergone several alterations, in the operative, as well as curative part of the process; but from the great frequency, and universality of this operation, it is somewhat surprising, that its approach towards perfection has been so exceedingly gradual.

It is not, however, my intention in this place, to give an historical account of Amputation, or point out the particular modes, and gradual improvements, that have been recommended, and practised, at different times, and by different authors; but availing myself of any hint, which they may have occasionally afforded

ed

ed me, shall begin the subject at the year 1779.

I believe the established practices of Amputation, in this kingdom, may be all resolved into three methods, viz. Amputation, performed by the double incision, or, as it is called, Cheselden's method; Amputation with a triple incision, or with the addition of a secondary circular division of the muscles immediately surrounding the bone, by the assistance of a small knife recommended, and practised by Mr. Gooch and others; and, lastly, the flap operation, which has hitherto been used only in certain cases.

Amputation performed by the double incision, is, at present, I believe, the method most universally adopted.

Mr. Alanfon, of Liverpool, published in the year 1779, a treatise intituled "Practical Observations upon Amputation, and the After-Treatment;" in which he recommends a practice, which he observes, is "the result of a considerable experience, for nine years in a public hospital." Vide, p. 7, preface.

After explaining his deviations, from the established mode of amputating by the double incision, and reciting the defects very frequently attendant upon that method, as usually practised; at page 33, he "brings into one view, the established mode of performing the operation of Amputation on the thigh, and the after-treatment, as practised in the Liverpool Infirmary."

"Apply," says Mr. Alanfon, "the tourniquet as usual, and let an assistant draw up the skin and muscles, by firmly grasping

grasping the limb with both hands, the operator then makes the circular incision as quick as possible through the skin, and *Membrana Adiposa*, down to the muscles: he next separates the cellular and membranous attachments with the edge of his knife, till as much skin is drawn back as will afterwards cover the surface of the stump with the most perfect ease. The assistant still firmly supporting the parts as before, apply the edge of your knife under the edge of the retracted integuments, and cut obliquely through the muscles upwards as to the limb, and down to the bone; or, in other words, cut in such a direction, as to lay the bone bare about two or three fingers breadth higher than is usually done by the common perpendicular circular incision, and continue to divide, or dig, out the muscles all round the limb, by guiding the knife in the same direction. The part where the bone is to be laid

bare, whether two, three, or four fingers breadth higher than the edge of the retracted integuments, or in other words, the quantity of muscular substance to be digged out, in making the double incision, must be regulated by considering the length of the limb, and the quantity of skin that has been previously saved, by dividing the membranous attachments. The quantity of skin saved, and muscular substance taken out, must be in such an exact proportion to each other, as that by a removal of both, the whole surface of the wound will afterwards be easily covered, and the length of the limb not more shortened than is necessary to obtain this end. The bone being now bare all round, is to be divided, as usual with the saw, and as high up as possible, which will be more easily executed, if the retractor recommended by Gooch and Bromfield, is first applied,
for

for the support and defence of the soft parts.

“ After the removal of the limb, let each bleeding artery be gently drawn out with the tenaculum, and tied with a common ligature, as naked as possible. The whole surface of the wound is now to be well cleaned with a sponge and warm water, as no doubt any coagula remaining upon its surface, or about the interstices of the muscles, would be a considerable obstruction to that desired union, which we have always in view through the whole plan. Let the skin and muscles be gently brought forwards; then fix the flannel circular roller round the body, and carry it two or three times round the upper part of the thigh, where it will form a sufficient basis, that will greatly add to the support of the skin and muscles; then carry it forwards in a circular direction till it arrives sufficient-

ly near the extremity of the stump, where it is to be fastened as usual. You are now to place the skin and muscles over the extremity of the bone, in such a direction, that the wound shall appear only as a line, drawn down the face of the stump, terminating with an angle, above and below, from the latter of which the ligatures are to be left out, it being the most convenient and dependent part. The skin is easily secured in this posture, by long slips of linen, or lint, about two fingers breadth, spread with cerate, or any soft cooling ointment, these are to be brought from side to side across the face of the stump; then apply over them a little soft lint, with a tow pledget, and compress of linen, the whole to be retained with a light linen roller*.

* Mr. Lyon first placed the skin in this direction, in an Amputation of the thigh, and dressed with a dry linen cross cloth, applied from side to side, next the face of the stump.

“ It

" It is the usual custom, to raise the end of the stump from the surface of the bed, with pillows; which appears to me very injudicious, when done to the height commonly practised, as it draws the posterior muscles off the face of the stump. I find the best direction is to raise the stump about half a hand's breadth from the surface of the bed.

1 " When the whole of the treatment has been agreeable to the foregoing directions, the parts are generally so free from spasms, that the use of opium is not requisite; the symptomatic fever will likewise be equally moderate; and upon the third or fourth day, when you change the dressings, you will always find that the discharge has been so small, as scarcely to have run through them: hence it is not often necessary to change the circular bandage, at the first or second

cond dressing; I rather wish to avoid it, till the adhesions are more complete.

“ By a continuance of the above simple treatment, varied as appearances indicate, the cures have been always completed in less time than usual. In the thigh the stump has frequently healed in nineteen days, so perfectly as to require no further dressing.

And in his postscript, p. 63. he proceeds, “ I am now of opinion, that, in general, it is the most judicious, to place the skin so as to form the line across the face of the stump, from side to side, the discharge is so small, that a depending drain is not a necessary object: the ligatures are the most conveniently left out at the inner angle, in the arm and thigh, on account of the vicinity of the great artery, in the fore arm and leg, they may be left out at either angle.”

Whoever attentively considers this account of the operation, and after-treatment, as delivered in Mr. Alanson's own words, will observe, that agreeably to his declaration made in page 6, in the same pamphlet, the leading objects which are to be kept in view, are "the saving as much skin and
" muscular substance, as will afterwards
" form a good cushion upon the ex-
" tremity of the bones," and by leaving out all extraneous substances, the ligatures of the vessels excepted, the attempting the "union of the parts by the first intention." V. page 13.

I confess, I could not conceive, how to accomplish the point of dividing, or digging out, with the common amputating knife, the muscles so very obliquely round the bone, as that gentleman so strongly recommends, nor could I be satisfied with his speaking so very
vaguely,

vaguely, respecting the quantity of muscles to be so dug out, such as from two to four fingers breadth higher than the edge of the retracted integuments, in order to bring the soft parts, into the nicest easy contact.

I readily acknowledge thanks are due to Mr. Alanfon, for reviving after Amputation, the practice of uniting the lips of the wound, by what is commonly called the first intention, a plan, which has passed entirely unnoticed, although, many years ago, it was recommended, and once successfully practised by the great Mons. Le Dran. See Le Dran's operations, translated by Mr. Gataker p. 430

Upon seriously reflecting then upon this subject, and being urged on, by the declaration made at page 64, in the aforesaid pamphlet, viz. " I am
" far from thinking that the operation
" and

“ and after-treatment, will not yet admit of further improvements in the hands of the judicious and candid practitioner”: and calling to mind the known effects of a somewhat similar practice, which I had seen confirmed; I presumed to recommend the mode, which will hereafter be described, to my ingenious, and worthy friend Mr. Tomlinson, in order to accomplish the same effects proposed by Mr. Alanfon's method.

At the same time applying that well known rule, of the diameter of a circle being nearly one third of its circumference, to ascertain in the Amputation of the different parts of the extremities, as nearly as possible, the precise quantity of soft parts, necessary to be preserved, in order, compleatly to cover the bone, and bring the lips of the wound into perfectly easy contact;
for

for example, if we suppose the circumference of a limb operated upon, i. e. where the bone is to be separated, to be nine inches, the diameter of the stump would be rather less than three inches, the half of this diameter, namely one inch and a half, gives nearly the quantity of soft parts necessary for the above purpose, which should be the depth of the circular lip of soft parts, viz. muscles, and integuments; two thirds of which, I chuse should consist of integuments carefully dissected, in the thigh, from the muscles, and the fascia situated on the outer part of the limb, leaving the other third part, to be obtained by the oblique division of the muscles, which is easily accomplished.

Thus possessed of these ideas, my friend Mr. Tomlinson first ventured, on January the 25th, 1780, to amputate the thigh of Ann Goldengay, in the presence

presence of Mr. Kennedy, Mr. Vaux and several other professional gentlemen, according to the method, which will be described in the following pages, which method can incontestably be proved, to be the only one used, and established in this town and vicinity from that very date.

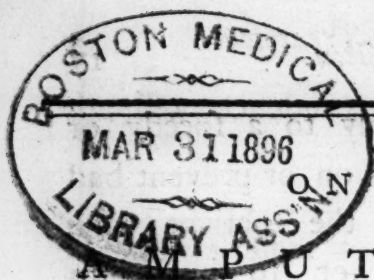
How far these numerous deviations, (which will hereafter be mentioned) from the above described mode, as delivered by Mr. Alanson, will be considered as real improvements, must be left entirely to the judgment of the candid practitioner, and ultimately be determined by the result of future experience; “ however if he has
“ the success, upon a trial of the
“ means here recommended, that has
“ attended their use under my observation, I hope it will appear, that
“ I have

“ I have not either misapplied my
“ time, or misled the public.” Page 64.

I must now therefore proceed to a narrative of the operative, as well as curative process of this particular mode; in the executing of which, if I have conveyed my ideas intelligibly, I shall be thankful, but if I shall be found to have been too prolix, must humbly request an excuse in the words of that excellent anatomist, and great improver of surgery, the late professor *Monro*. V. ed. medic. essays, vol. 4th. page 257.

“ In the operations of surgery” says the celebrated professor “ there is a number of little circumstances, several of which seem at first view to be of no great consequence; but when their observation or neglect comes to be attended to in practice, they are found to contribute

contribute considerably to a speedy or tedious cure, to bring on or prevent bad symptoms, to keep the patient easy, and preserve him, or to put him to pain and bring him into danger; and therefore their good or bad effects ought to be duly considered, and the proper cautions concerning them ought to be given by those, who write for the public upon such subjects."



ON THE
AMPUTATION
OF THE
THIGH,
AND THE
AFTER-TREATMENT.

1. **L**ET the screw tourniquet, with a small linen compress, consisting of eight doubles, placed upon the course of the femoral artery, be applied upon the thigh, as near to the groin as possible.

2. And let a narrow slip of linen, spread with sticking plaister encircle the lower part of the thigh, the upper edge of which must approach as near to
the

the diseased part, as prudence will admit.

3. The tourniquet must now be screwed sufficiently tight, to intercept the circulation, and an assistant must by grasping the limb with his hands below the tourniquet, uniformly and firmly retract the integuments upwards, supporting the skin, as tensely as possible, another assistant supporting the lower part of the limb at the same time.

4. The operator now upon the tense skin, close to the upper edge of the sticking plaster, begins his circular incision, directing the edge of his amputating knife obliquely upwards, carrying it carefully round the limb in the same direction, and cutting through the integuments only.

B 2

5. He

20 *On the Amputation of the Thigh,*

5. He then with his left thumb and fore-finger, takes hold of the edge of the divided integuments, and with a common dissecting knife, carefully separates, or dissects the cellular membrane, which connects the integuments to the muscles, and to the fascia covering those situated on the outside of the thigh; beginning at its upper part, there forming a lip of a certain extent, and proceeding uniformly round the limb.

6. The assistant again firmly and uniformly supporting the parts as before, and another assistant now turning back the lip of the circularly divided integuments upon the skin, on the upper part of the thigh, observes to retain it so folded back, during the time of dividing the muscles; in this he will be occasionally assisted by the left-hand of the operator.

7. The

7. The operator now reapplies the edge of his amputating knife, close under the lower and inner edge of the reflected lip of integuments, upon that particular part of the limb, on the furthest side from him, that he may, by casting his eye above, and below the limb, see the two ends of the blade of the knife; obviating by these means, the danger of injuring that part of the inverted lip of integuments, which always lies out of his sight during this stroke of his knife, and observing its oblique direction upwards as before, by this secondary circular incision he cuts through the muscles and periostium, quite down to the bone.

8. Let a thin leather retractor be conveyed round the bone, and be applied transversely against the soft parts, crossing the lower end under, or within its up-

22 *On the Amputation of the Thigh,*

per end, then deliver it to the assistant, who must, with it, carefully, and not forcibly retract the muscles, rather higher than the square of their division at the bone, and being further assisted by the operator's left hand, must defend the soft parts from any injury by the saw, during its operation.

9. The assistants now supporting the limb very steadily, and horizontally; the bone must be carefully sawed through, close to the retractor, without paying any attention to the scraping of the periosteum.

10. The diseased part of the limb being thus removed, if any rough points should appear at the edge of the bone, they must be pinched off, with the bone nippers, or cut away smooth with a strong knife; the bone, and its adjacent
parts

parts must then be wiped with a sponge wrung out of warm water, clearing them from any small particles of bone, &c. that might be lodged there, during the action of the saw.

11. The end of the femoral artery must now be gently drawn out from the surface of the stump, by piercing through the sides of its tube, very near to its extremity with the tenaculum, and be cautiously held forth, while a round ligature, composed of five or six doubles of shoe-maker's thread, according to the size of the vessel, sufficiently waxed, is carefully passed round it, close behind the tenaculum, keeping the ends in a line parallel to the face of the stump, and secured by drawing the knots only moderately tight, including in the noose, as little cellular membrane as possible, and leaving the ends of the ligature sufficiently long.

24 *On the Amputation of the Thigh,*

12. The perfect security of this vessel from hæmorrhage may be easily ascertained, by only gently slackening the tourniquet, so much, as to enable you to see the pulsation at its extremity; which being done, you must then immediately, and entirely remove all pressure upon the vessels, caused by the tourniquet, when you will observe an hæmorrhage flowing from two, three, or perhaps more, moderate sized arteries, as well as from nearly the whole surface of the stump, even from the bony cancelli.

13. Let an assistant now press moderately, and regularly with a finger against the extremity of each of the larger bleeding arteries, just sufficient to restrain the blood, for a little while only, and you will very soon perceive the
bleeding

bleeding from the other parts of the wound cease of its own accord.

14. The largest sized artery of these muscular branches, must then be first secured, by a proper sized ligature, agreeable to the directions already given for securing the femoral artery, and so proceed to the next sized vessel in order.

15. But if it should accidentally happen, that the end of one of these bleeding branches is retracted within the muscles, so far as to elude the touch of the tenaculum; the patient must then undergo the additional pain, of having a small needle with a ligature passed, thereby securing it as nearly in the manner aforesaid as possible.

16. Having thus separately secured all the arteries that seem to require it,
the

26 *On the Amputation of the Thigh,*

the grumous blood lodging upon any part of the surface of the wound, must by a moist warm sponge, be gently, and carefully cleaned off.

17. The integuments, as well as muscles of the thigh, are now to be gently and carefully brought downwards, by the hands of an assistant uniformly surrounding the limb, towards the face of the stump, and supported there; while a long callico roller, about three inches wide, being first secured to a band made of the same material, placed round the patient's body, is then carefully applied spirally, inverting it occasionally round the limb; beginning at the superior part of the thigh, and continuing it down very near to the edge of the lips of the integuments, making such uniform, and gentle pressure only,

ly, as may be just sufficient to retain them from retracting.

18. A soft loose cloth being now gently laid over the limb, the patient must be carried to bed, and carefully laid upon that side, on which amputation has been performed, placing the muscles of nearly the whole body, in the most easy, and relaxed state possible, i. e. laying the under arm flat upon the bed, more than half extended, with its fore arm bent towards the breast; the head and face resting sideways upon a pillow, a part of which must be placed upon the arm, and part on the fore arm; inclining the chin gently towards the bosom; the upper arm hanging forwards upon its side, with its fore arm bent across the breast, resting chiefly upon the bed, and loosely infolded with its fellow; the upper fore arm and hand lying
rather

28 *On the Amputation of the Thigh,*

rather supine, and the under ones nearly prone; the wrists and fingers lying loosely bent against the bosom; the body inclining rather forwards and the middle part of the back projecting a little outwards; the lower sound limb, nearly in a half bent state, resting the knee and leg upon a pillow, and the muscles belonging to the stump, somewhat corresponding, but bearing their weight perfectly upon the bed, and rendering themselves entirely passive.

19. An assistant now raises up this passive stump, while you convey underneath it, the many tailed bandage, placed upon a thick soft double cloth, when the stump must be laid carefully upon it; and then very cautiously wipe off any small coagula, or sponge up any fluid blood, that may appear in the wound, occasioned by the action of
the



2
re
ly
le
b
n
li
n
a
b
r
P
U
F
r
c
v
A
K
e
n

the muscles, &c. while the patient was carried to, and placed in bed.

20. The ligatures surrounding the vessels, are cautiously, and respectively to be sought for, and all brought together at their extremities, forming in the directest line, as little extraneous substance in the wound as possible, and their ends must be cut off, about half an inch longer than the lips of the wound.

21. You now begin to alter the face of the stump, making the nicest approximation and adaption of the soft parts possible; and by very cautiously and uniformly extending the lips of the integuments, beyond the extremities of the muscles, and artfully bringing them into perfectly uniform, and easy contact, as well as all the deeper seated
soft

30 *On the Amputation of the Thigh,*

soft parts, as much as possible, close up the lips of the wound, in the form of a single horizontal line.

22. Thick pledgits of lint, about two inches broad and five inches long, spread rather thin with a cerate, composed of equal parts of yellow wax and oil, must be carefully applied over the face of the stump, fixing them on the lower part first, and drawing them gently upwards, while the upper edge of the lip of integuments, is carefully with the fingers pressed forwards and downwards, turning up the ends of the ligatures, within the pledgits, and covering them.

A lint compress rather more than two inches wide, and four inches long, must be applied over the pledgits, on each side the horizontal line, formed by the
lips

lips of the wound, placing their edges nearly close together; the longitudinal tails of the bandage are now to be gently, and artfully passed over the dressings, on the face of the stump, while the upper soft parts are again lightly to be brought downwards and forwards; these tails are to be uniformly and gently secured against the end of the stump, by the transverse tails of the bandage being applied over them, and round the limb, according to the usual method of securing the eighteen tailed bandage.

O B S E R V A T I O N S
AND
I L L U S T R A T I O N S

ON THE

Amputation of the Thigh, &c.

1. **T**HE tourniquet when applied as near to the groin as possible, not only compresses the arteries, as well as when placed lower upon the thigh, but leaves the lower part of the limb, especially in short thick thighs, more at command for the assistant to retract the integuments, &c.

2. As none but expert, and very steady operators should pretend to amputate

tate without some guide for the knife, the circular slip of sticking plaister is here expressly intended for that purpose, it being of some importance in the nice adaption of the parts afterwards, to prevent an unequal lip from being formed, which might retard the cure, and which would be the more likely to happen, from the firm retraction of the skin, when the circular division of the integuments, was nearly completed. This slip of plaister may at the discretion of the operator, be applied antecedent to the tourniquet, or even before the patient is moved from bed, if thought necessary.

3. The assistant is here directed to retract the integuments only; for I believe, that the muscles will not suffer retraction, until partly or wholly divided.

C

4. The

4. The operator must place himself upon the outside of the limb, if the right thigh is to be amputated, and on the inner side of the limb, in the amputation of the left thigh, in order to have the full command of his left hand occasionally, for purposes which will be hereafter mentioned. Supporting the skin as tensely as possible, facilitates the passing of the knife through the integuments, and perhaps occasions less pain to the patient.

It is best to begin this circular incision of the integuments, upon the side of the limb farthest from him, as directed for the first application of the knife in the secondary incision, which see.

The upward oblique direction of this incision, especially in such thick and hard

hard integuments, as are sometimes met with, is of some importance, in the nice adaption of the lips of the wound afterwards, thereby rendering the cure more speedy, and the line of the cicatrix narrower.

5. I readily acknowledge this part of the process to be tedious, and to unwary by-standers, it may assume the appearance of cruelty, but we know, that this dissection consists of nothing more, than mere cellular membrane, the universally connecting medium of the whole body, and constituted by nature, from its universal use, of nearly as insensible a substance, as any part of the whole frame; and although, this freedom of dissecting it, has not been hitherto applied to amputation, yet, in a variety of operations, such as castration, the extirpation of scirrhus, cancerous, carcinomatous,

cinomatous, steatomatous, and incysted tumors, &c. a preservation of sound integuments by thus dissecting the cellular membrane, is of the utmost importance, in obtaining a speedy, safe, and good cure.

As this deviation in the process of Amputation, is diametrically opposite to the practice taught by Mr. Alanson, I must here beg leave to make a digression, and introduce some of the principal arguments, which he makes use of, in support of his doctrine. At page 54, in his second edition, he says, it is to be observed, "that the more
"muscular substance we save, by fully
"giving the oblique direction to the
"knife (instead of dividing the membranous attachments) the better." At page 62, he tells us, "I am fully convinced in the thigh Amputation, that
"the

On the Amputation of the Thigh, &c. 37

“ the oblique division of the muscles
“ is attended with many advantages,
“ over the perpendicular circular in-
“ cision, although in the latter, as much
“ skin has been saved, as would ful-
“ ly cover the whole surface of the
“ wound. Where the arm, forearm,
“ or the usual place below the knee,
“ are the subjects of Amputation, it is
“ not of so much consequence, whether
“ this turn is given to the knife ;
“ since as much skin and adipose mem-
“ brane may be always saved without
“ it, as will cover the surface of the
“ wound, the union will as speedily
“ take place, and the cures are equally
“ compleat.

“ The case is materially different in
“ the thigh ; here we want a sufficient
“ cushion between the bone, and machine
“ to be used in walking ; and conse-
“ quently,

38 *Observations and Illustrations*

“quently, the more freely the oblique
“turn is given to the knife, the more
“will the extremity of the stump be
“furnished with muscular substance;
“and the farther will the point of
“bone, on which the *pressure* *princi-*
“*pally produces inconvenience* be remov-
“ed from the surface of the machine.

Again, at page 68, “the most plump, uni-
“form, and in short the best stumps I have
“seen, are those, where the skin has been
“so exactly adapted to cover the wound,
“that slips of sticking plaister have been
“required to draw together the edges
“of the wound, and retain them in
“contact. Hence it is to be inferred,
“that too much skin saved is disadvan-
“tageous.

And lastly at page 164, speaking of
the thigh Amputation, and that above
the

the ankle: "here a proportional weight
"of the body in walking is to be sup-
"ported upon the *extremity* of the
"stump."

From these extracts then, it appears
that the great object of consideration
with Mr. Alanson, is the preservation
of a muscular cushion at the extremity
of the bones, to support the weight of
the body in walking: very plausible rea-
soning indeed, was such a cushion
really wanted, but whoever gave it much
daily use, I am afraid would very soon
wear it out.

The fact, I believe is the reverse,
and no such weighty pressure is ever
made upon the extremity of the stump,
as any person may be convinced, by giv-
ing himself the trouble of examining
the first poor one legged man, that he

fees hopping about the streets, where Amputation has been performed above the knee; for he will observe that the construction of the wooden leg with the addition of compresses or pads applied to its upper part, is evidently so ordered, that pressure upon the extremity of the stump is intentionally avoided, and the weight of the body in walking, bears principally against the tuberosity of the ischium, the outside of the great trochanter, and upon the posterior, as well as on part of the glutæi muscles.

After the same manner, is the pressure removed from the extremities of the bones in the long stump, made below the knee, as Mr. Bromfield informs us, in his first volume of surgical observations, at page 188, receiving the hint in the year 1740, from a poor woman, who

who having lost both feet from a mortification, had contrived machines to walk with, bearing her weight against the sides, and upper parts of the cases, and padding them occasionally.

Believing then the use of a muscular cushion to be merely ideal, and placing a confidence chiefly in the preservation of integuments, for an easy, speedy, and firm union of the divided parts after Amputation above the knee; which union in the arm, forearm, and the usual place below the knee, Mr. Alanson himself acknowledges will as speedily take place, and the cures be equally complete: why should we endeavour to multiply the methods of Amputation (especially by introducing more painful, and precarious modes) adapting them to the supposed advantage of each different part

part of the body, that might require such an operation?

Upon a fair enquiry into this matter, I believe no real necessity will appear for such proceedings; as this one general mode, with such trifling deviations occasionally, as any discreet, and experienced surgeon will easily suggest, may with the greatest propriety, be applied to every part of the human body, requiring such operation: whether it be the thigh, the usual place below the knee, or the long stump, as it is called, the arm, forearm, fingers, toes, or penis; and equally to the Amputation, or extirpation of several species of diseased tumors, afflicting various parts of the body; all which from experience, I can fully testify have proved alike successful; although in the operation upon several of the aforesaid diseased parts, we
cannot

cannot possibly have any other covering than mere integuments, to promote their union by the first intention, nor should we indeed for the above purpose, desire any further substance, since it is a well known fact, that cellular, and adipose membranes have the strongest disposition to unite by the inflammatory adhesion of any parts of the human body.

And "it is an infallible maxim, that the more the surface of a wound is diminished, by a judicious covering, from an artful preservation of skin, the less pain, and inflammation will follow, and the more speedy will be the cure." Alanson 2d. edition, page 174.

6. The latter part of this direction proves the necessity of the operator always placing himself on the outside of the

44 *Observations and Illustrations*

the limb, when he operates upon the right, and on the inside, when he operates upon the left limb.

7. Placing the knife at this secondary incision, agreeable to the direction here given; and exactly parallel to the under edge of the reflected lip of integuments, effectually prevents the lip being cut through, at this obscured part; an accident, that more than once has happened, for want of such direction.

8. For want of observing this caution, in applying the retractor, the lower and outer end, has sometimes been engaged in the teeth of the saw, which cannot fail to embarrass the operator.

The assistant cannot be too much cautioned against forcibly retracting the soft parts, for fear of tearing the muscles,
or

or periosteum from the bone, thereby endangering exfoliation.

9. The assistants cannot be too steady in this part of the process, and must hold the bone perfectly horizontal, while the operator saws it through, first looking along the back of the saw, taking care to apply it exactly square upon the bone, beginning with light, short, strokes, and ending in the same cautious manner.

The periosteum should not be scraped, for fear of uncovering the bone, more than necessary, for it neither gives pain to the patient, nor is it found ever to impede the action of the saw.

10. The leaving any rough points at the under edge of the bone, may be prevented by the assistants and operator
strictly

strictly attending to the directions given in the last section.

All extraneous bodies, (the ligatures excepted) should no doubt be carefully cleared away, from every part of the wound.

11. The extremity of the divided femoral artery, as well as of others, may agreeable to this direction, be made perfectly secure from future hæmorrhage, and with as little pain to the patient as possible; while the caution of gently drawing out its end, and securing the ligature by drawing the knots only moderately tight, is the most likely means of preventing an immediate separation of the circular fibres of the vessel taking place, thereby rendering the ligature useless, and giving occasion to call the vessel rotten.

The

The ligature also being thus applied, near to the extremity of the artery, and drawn only moderately tight, may perhaps further assist the natural adhesion of its sides, and when it becomes loose and useless, be more liable to slip easily, and sooner over its end, leaving the vessel entire, without producing any separation or loss of the tube.

12. By attentively observing the directions given in this paragraph, as well as the three following, viz. 13, 14, and 15, it frequently has happened, that not more than two muscular branches have required the use of the ligature, in an Amputation of a moderate sized thigh: an object of great consideration, especially in this mode of attempting the union of the divided soft parts, by the first intention: for by merely continuing the pressure of the fingers against the
extre-

extremities of the smaller arteries, only during the time of securing the largest muscular branches; upon their removal, it is not uncommon to see the hæmorrhage in a great measure, and sometimes, entirely suppressed.

And daily experience further evinces, that the smaller arteries, when transversely divided, from their own natural elastic structure, contract, and withdraw themselves, so as generally to stop the further effusion of blood.

We need not therefore be too solicitous about the security of these small arteries by ligature; for if the recently divided soft parts are gently brought together, and nicely retained in contact; if a passive state of the muscles, (as I have above described) surrounding them is duly attended to, and their
own

On the Amputation of the Thigh, &c. 49

own natural contraction properly assisted, by the judicious, and artful application of bandage; a perfect security from future hæmorrhage will be insured, as well as the most likely means employed, to obtain a speedy, and easy cure of the wound by the first intention.

Upon these principles in the course of my practice, for several years past, I have effectually restrained hæmorrhages from divided small arteries, and cured accidental incised, or even lightly contused wounds in different parts of the body, by the first intention.

And within some few years past, in accidental wounds, I have practised the above mode of suppressing hæmorrhages, from divided arteries of some considerable size, viz. in the division of the artery which is situated betwixt the
D thumb,

thumb, and fore-finger; in that, which passes in the upper part of the masseter muscle; in an artery running in the palm of the hand; in a division of the radial, and ulnar arteries near to the wrist; and in a section of the arteria tibialis postica, about the middle of the leg: all which cases proved equally successful, for by strictly observing the truly passive state of those muscles lying contiguous to the respective vessels; by artfully approximating the soft parts, and closing the lips of the wound; by applying slips of sticking plaister, and a well regulated compressive bandage; the hæmorrhages were suppressed, the divided parts were speedily united, and perfect cures very soon followed.

16. Having now gone through the operative process, we proceed to the curative part, which is best promoted,
by

by lessening the superficies of the very extensive wound, thereby obviating many dreadful consequences, and promoting the speedy union of the divided parts as much as possible, by the first intention.

The directions therefore, given above, are obviously calculated, as preparatory for such union.

17. For this important purpose of sufficiently restraining the muscles and integuments from retracting, is used a bandage of callico wrappering, which, for nearly twenty years past, has been the material that I have always preferred, for making every species of that inestimable assistant in surgery, the roller; since callico being the medium between flannel and linen, as to warmth and elasticity, and from its softness,

and thinness, adapting itself so easily, and nicely, to any particular purpose, yet possessed of substance, perfectly sufficient for every necessary intention, to which it may occasionally be applied, I think, therefore, it may justly claim the preference to either.

Although this spiral bandage has generally been hitherto applied, while the patient remained upon the operating table; yet, I believe it may more advantageously be done, after his being placed in bed.

18. It is somewhat extraordinary, that the importance of thus rendering nearly the whole order of muscles as relaxed as possible, merely by position, immediately after the Amputation of different parts of the larger limbs, and the more especially of attending to the passive state
of

of the remaining portions of those muscles immediately concerned in the operation, should have been in all ages, entirely overlooked.

Being well assured, that the great importance of this subject demands our most serious consideration, I must beg leave therefore to be indulged in offering a few remarks upon this occasion.

I readily acknowledge, that the use of the lax position of the muscles of the limb, in the reduction and cure of fractures, and of the muscles in the reduction of dislocations, immediately belonging to the dislocated joint, has been pretty generally adopted, for these twenty years past; but no one (to my knowledge) ever yet applied this practice in the treatment of stumps, after Amputations; notwithstanding, its certain and well

54 *Observations and Illustrations*

known effects, as deduced from anatomy, are so evidently, and manifestly calculated for the prevention, and cure of several of the most dreadful and alarming symptoms, and consequences, usually attendant on Amputations; and which have been so much, and too justly complained of, by the best writers upon this subject, even when the business has been conducted agreeable to their own directions.

Merely placing the patient exactly in this most universally relaxed state, cannot accomplish all the wished for purposes, without making him perfectly sensible of the great necessity of his attending to it, during the cure, and most strictly observing it, with those muscles immediately appertaining to the stump; at the same time making him well acquainted with the nature of a relaxed muscle,

muscle, as well as strongly recommending the most perfect composure of mind.

If we now enquire after the advantages to be obtained, by thus placing the patient in nearly the universally relaxed position, with strict injunctions, as above directed, we shall find, that he will be enabled to lie easier, and longer in that position, than in any other; that he may be readily assisted, occasionally, with food or medicine, and the removal of urine, or stool, may as easily take place, without the least danger of producing contractions of the remaining portions of the muscles terminating in the wound.

That those dreadful symptoms so frequently subsequent to Amputation, such as great pain, and spasm, secondary hæ-

morrhage, smart symptomatic fever, high inflammation, with great tension of the adjacent parts, large suppuration, frequent contractions of the remaining portions of the muscles terminating in the wound, producing a retraction, and separation of the periosteum from the bone, thence causing exfoliation, and a tedious, painful cure, concluding generally with a pyramidal stump, sometimes with an incurable ulcer, and at others with death itself; may some of them I presume, principally by the observance of this position of body and mind, most friendly to nature, and of the truly passive state of the portions of muscles appertaining to the stump be entirely warded off, and the others rendered exceedingly mild.

And may not, by the same parity of reasoning, that most alarming, and generally fatal symptom, the locked jaw, originating perhaps from the peculiar

culiar idiosyncrasy in extremely irritable habits be powerfully guarded against; by thus preserving by far the greater number of muscles, particularly those terminating in the surface of the stump, in a non-resisting state, and keeping the mind perfectly serene?

Thus also, may the very liberal use of opium, be in a great measure superseded, as experience hath sufficiently confirmed.

It is true, this passive state may sometimes be induced, though in a less pleasing manner, by opium; but in most constitutions, opium occasions more or less inconvenience, costiveness is generally the effect of its use at first, and the consequent straining at stool distresses, and disturbs the patient. Some patients it renders more irritable than before, and others absolutely delirious. When given at first in large doses, and those continued

nued a considerable time, the patient sinks, when you wish to omit them, for want of the accustomed cordial, and I have known those, who could not without the greatest difficulty, be brought to exist without them. It is not my intention to condemn the use of opiates after all operations, I only mean to censure their universal and indiscriminate use.

Hence likewise in general, may the long established practice of stitching wounds be fairly exploded; since by very carefully attending, as above directed, to the lax position of the adjacent muscles, and the divided parts themselves, the lips of a wound may be much easier, and more uniformly retained exactly in contact, by the artful application of superficial dressings, assisted by a gently compressive

pressive soft callico roller, than by sutures applied at stated distances.

The important advantages thus obtained, are not merely confined to Amputations, but may be equally extended to every operation in surgery, and to the cure of all divided parts of the body, whether simple, or complicated; in a variety of which cases, I have long since fully experienced them, and the more especially, in those, where a speedy union, (by the first intention) has been anxiously wished for, a practice, which, in the generality of cases, with great truth I can assert, cannot be too freely adopted.

19. The many tailed bandage was first introduced, by my ingenious, and worthy friend Mr. Kennedy. It consists of four, or five slips of callico,

lico, sewed together as you would make an eighteen tailed bandage, with a longitudinal slip, sewed to them crossways, broad enough to compleatly cover the face of the stump, to which it is to be applied; by dividing this longitudinal slip into three, or more tails at discretion, as far up as the lower edge of the transverse tails, the bandage may be more artfully applied.

The number of transverse tails, which are to surround the thigh, as well as their length are to be regulated, agreeably to the circumference, and length of the limb to which the bandage is to be applied.

This bandage, undoubtedly claims the preference to all others, in this mode of dressing the stump, so long as there seems an absolute necessity, for preserving

On the Amputation of the Thigh, &c. 61

ing it in a truly passive state; but towards the close of the cure, when that period is over, the double headed roller artfully applied, will be found most advantageous.

I constantly use the double headed roller immediately after the Amputation of the arm, fore-arm, or fingers; regulating its width according to the circumference of the different parts to which it is to be applied.

As a discharge of blood, more or less, is always excited, by carrying the patient to, and placing him in bed, the above direction sufficiently proves the propriety of this manœuvre, by giving a further opportunity of removing every impediment to the desirable union by the first intention.

20. By attentively observing the above described method of suppressing the hæmorrhage from the divided arteries, thereby studiously avoiding a multiplicity of ligatures; less extraneous substances will be left in the wound to obstruct the immediate union of the divided parts, and consequently less irritation of the wound will take place.

21. As no limb belonging to the human body is truly circular, and as the bone, or bones, are not exactly in the center of any of them, placing the patient on the side posture, with the stump in a passive state, immediately changes its nearly circular face, to almost the form of an oval, consequently, a much better approximation, and adaption of the divided parts must certainly ensue; and less compression will afterwards be necessary

On the Amputation of the Thigh, &c. 63

necessary to retain the horizontal lips of the wound in uniform and easy contact.

Great circumspection is required in cautiously extending the integuments, beyond the extremities of the muscles, particularly of the posterior ones, for if they be not artfully applied at the first dressing, the inflammatory adhesion very soon taking place, causes them to tuck in, thereby frustrating the intention of a speedy union of the lips of the wound.

22. The face of the stump being thus studiously, and attentively closed up into a mere horizontal line; mild, simple, superficial dressings, applied as directed, together with the two soft compresses, and a gently retentive, and only lightly compressive bandage, are all that are found necessary, in general, to complete the cure.

But

But here I must beg leave to remark, that too much circumspection, and diligence, cannot possibly be given, to every minute part of this most important first dressing; as that circumstance alone generally determines, whether the cure shall eventually prove long, tedious, and painful, or agreeable to the words of Celsus, "*cito, tuto, et jucunde*;" a maxim, which to the utmost of my power, I have constantly applied to the cure of every surgical disease.

By carefully attending to the above method of Amputating, and after-treatment, the practitioner will in general observe, upon removing the first dressings at the usual time, viz. on the third or fourth day from the operation, that adhesions of the soft parts more or less considerable have taken place, consequently,

frequently the discharge from the wound very trifling; and after the removal of the first foul dressings, by carefully renewing and applying them every day afterwards, merely superficially, and regulating the bandages discretionally, as circumstances may indicate, the cure will be speedily obtained, generally within a month or six weeks, and frequently in the space of three weeks.

But it has now and then happened, that very little inflamminatory adhesion of the soft parts has taken place from the first dressing, which may be early known by the pain, &c. being rather more violent than usual, and by a more copious and offensive discharge draining through the dressings, and rendering the bandages fouler; this accident may, probably, sometimes be owing to the very diseased state of the patient, at

E

the

the time of the operation, as well as perhaps, to a want of a due observance of the truly passive state of the remaining portions of the muscles belonging to the stump, and a well regulated bandage. But whenever this unfriendly accident does happen, it retards the progress of the cure only a few days; for as soon as the process of digestion is become complete, the wound is then prepared, and so well formed for the secondary union taking place, that by a nice approximation of the well digested surface of the stump, by bringing its lips into gentle contact, and artfully retaining them so, with slips of sticking plaster, or a very lightly compressive bandage, a speedy union of the soft parts will certainly follow.

The ligatures surrounding the extremities of the vessels, being secured as
above

above described, generally separate spontaneously, in eight or ten days from the operation; if not, they may be easily removed, by gently drawing at each end alternately, during the times of dressing, and when separated, the small sinus occasioned by their continuance, in a few days closes up, leaving the remaining sore superficial, which of course very soon heals.

Being well convinced of the absolute necessity of keeping divided parts in as perfect a state of rest as possible, as well as retaining them in easy contact, in order to accomplish the much wished for effect, the union by the first intention; I cannot therefore recommend the practice of that most important position of the body, viz. the universally relaxed state of the muscles too forcibly; as well as confining the

patient to bed, till the cure is nearly completed, well knowing their efficacy in expediting the same, and with proper cleanliness, and change of linen, I suspect confinement in bed to be incapable of producing either hectic fever, or diarrhæa.

But as a successful practice, is the best testimony, that can be given to establish any doctrine, however ingeniously framed; I must now therefore beg leave to produce some facts, to confirm that, which has been laid down in the foregoing pages; and for this purpose, shall introduce two letters received from my friends, Mr. Kennedy, and Mr. Freer, jun.

To

On the Amputation of the Thigh, &c. 69

TO MR. MYNORS, Surgeon.

SIR,

“ AS you inform me you are going to publish on Amputation, I beg leave to propose to you to lay before the public the following narrative.

“ On Feb. 26, 1781, in consequence of a letter I received from Mr. Alanfon of Liverpool, who in 1779, published practical observations on that subject; I wrote to inform him of the success which had attended the Amputations in the Birmingham general hospital, from the time of his publication, and it was then my opinion that the surgeons of this hospital had followed his practice; but upon a more minute comparison of Mr. Alanfon's method of performing the operation and after-treatment with that adopted in this town, and neighbourhood

bourhood, since January 25, 1780, I find the deviations are so very material, that I think it may, without injustice to Mr. Alanfon, be confidered a different practice. Notwithstanding which, that gentleman is juftly intitled to my warmeft acknowledgments, for propofing an improvement in furgery which has been attended with fuch happy confequences.

I am, Sir,

With the greateft refpect, yours, &c.

Birmingham,
Feb. 4th, 1783.

G. KENNEDY."

To Mr. MYNORS, Surgeon.

DEAR SIR,

"I BEG the favor of you to insert in your publication, the following particulars, relating to the mode of Amputation, which has fince Jan. 25, 1780, been practifed in the Birmingham general hofpital.—When I firft wrote to Mr. Alanfon, I defcribed fome deviations

tions from his practice, that had been adopted in this hospital.—I afterwards informed him, that, allowing for these deviations, I had seen twenty cases amputated in his way.—I could have wished that Mr. Alanfon had in his extracts from my letters, taken notice of the circumstances in which we deviated from his method; as it is proper to inform the public, that although the operations I alluded to, were all performed with a special view to the idea of uniting the wounded parts by the first intention, yet the means used for that purpose, were different from those which Mr. Alanfon had proposed, not only in the particulars mentioned to him in my letters, but in several others, which have been attended with advantages and success.

I am, Sir, respectfully,

Your humble servant,

Birmingham,
Feb. 10, 1783.

J. F R E E R, junr."

E 4

The

The above letters are here published, in order to rectify some mistakes, which have been inserted in the second edition of Mr. Alanson's observations on Amputation, &c. beginning at p. 214, and contained in three epistles addressed to him from the aforesaid gentlemen: the first dated Feb. 26, 1781, by Mr. Kennedy, beginning thus:

“Your mode of amputating has been practised in the Birmingham Hospital, with the greatest success. Eleven cases occurred there in the last year, all of which did well; most of them were cured in five or six weeks, and many of them in two or three and twenty days.

“A Girl, a patient of my own, aged sixteen, had her leg amputated below the knee, April 29th, and was discharged cured, May 20th.”

Mr.

On the Amputation of the Thigh, &c. 73

Mr. Freer's first letter, as alluded to above, is dated March 13th, 1781, beginning:

"I think it my duty to inform you of the success that has attended your mode of Amputation, in my practice, and in that of my colleagues at this Hospital; as it cannot fail giving you pleasure, and, by confirming the propriety of the method, may assist in rendering it universal.

"A conviction in my mind of the advantages to be gained by it, set aside those prejudices, which we are apt to have for old methods; and which alone, in my opinion, can prevent your mode of Amputation from being universally adopted. Although my first operation was not attended with the success that our later ones have, yet, we gained great advantages over the old method,
and

and sufficient to induce us to put it again in practice, when an opportunity should offer.

“ Mr. Kennedy has, I think, informed you of the success in some instances; and I now add to them the following.

“ 1. A man aged thirty, cured in twenty seven days, below the knee.

“ 2. A man aged thirty two, cured in twenty six days, below the knee.

“ 3. A girl aged fifteen, cured in eighteen days, above the knee, including that of the operation. No one disagreeable circumstance supervened in any of these cases; and their stumps are remarkably good. Exclusive of the advantages gained by the speedy cures, there

there is another still greater; and that is no less than the preservation of the lives of the patients in many instances. No 1, and 3, were so much exhausted by discharges from the diseased joints; and had likewise such a copious expectoration of purulent matter, with a violent cough, that we should have had no hopes of their recovery, had they been to have undergone the suppurations, and the long confinement of the old method.

“ Out of a great many cases that have offered and undergone the operation, though several were deplorable, we had the good fortune not to lose one.”

And his second letter, dated Oct. 28, 1781, begins thus:

“ I can

“ I can now say that I have seen twenty patients amputated in your way ; and that out of these, only one can be said to have died of the operation, or in any consequence of it. Many of them were in so perilous a state of health, as to be thought incapable of bearing the operation ; and that, in my opinion, the lives of several were saved, by the advantages this operation has over the mode commonly used. The discharge has, in every case, been very small ; so trifling as not to render it dangerous, even to the weakest habits. The spasm subsequent to the operation of Amputation, has been to us unknown, except in one instance, which was that of the boy who died ; and the patients have in general, when put into bed, been easier, and better in health, than before the operation. The fever has in every case been trifling, and we have had

no

no hæmorrhage that required the dressings to be changed, but in one case.

“ I have cured one in eighteen days, after Amputation in the thigh; but we have several cured in between twenty and thirty days; and some have held out for six weeks or two months. If a stump is not healed in five or six weeks, I think it an unfavourable case, unless the limb is very large.”

It seems highly necessary to observe, in this place, that all the Amputations mentioned by both these gentlemen, the first case excepted, happened on, or subsequent to, the date of January 25th, 1780, consequently, were performed, and their cures effected, agreeable to the method before described.

To the above facts, further confirming the aforesaid practice, may be added

ded many more cases of Amputations of the larger extremities, recorded in the experience of several ingenious surgeons, as well as in my own; where the cures having been conducted agreeable to the above plan, have proceeded in the same expeditious, and mild manner; although, in several of them, the lives of the patients, at the time of the operations, were apparently brought into the most extreme danger, by the long continuance of greatly diseased joints, &c. and their usual dreadful consequences. And I here return thanks to the gentlemen alluded to, particularly Mr. Kennedy, Mr. Freer, jun. Mr. Vaux, and Mr. Tomlinson, for adopting the above recited mode, with such readiness and attention.

O F T H E
A M P U T A T I O N
O F
D I F F E R E N T P A R T S
O F T H E
E X T R E M I T I E S.

IT has been observed agreeable to the doctrine laid down in the foregoing pages, that the principal dependance, for a speedy, safe, and easy cure of the wound formed after Amputation of the thigh, has been placed upon the free preservation of integuments chiefly; ascertaining the certain proportion necessary to be preserved in each operation, according to the circumference of the limb, at the place intended for the division

division of the bone; and further remarked that the mode of operating as above described, with a trifling alteration occasionally, hath been found equally applicable to any portion of the different extremities, that required such operation; as well as to the extirpation of various species of diseased tumors, to obtain the same good effects.

Let us begin then with the Amputation of the leg, at the usual place below the knee.

On the AMPUTATION below the KNEE.

IN this operation, placing the tourniquet immediately above the knee, and the slip of sticking plaister as your guide at a proper place upon the leg, after making your circular incision obliquely upwards through the integuments, you dissect them from the tibia, and
from

Different Parts of the Extremities. 81

from the fascia placed on the outer part of the limb, as before directed, to a proper extent, and then carry your dissection uniformly round the limb; but observing the anterior part of the tibia has naturally no muscular covering, we must here then be content with a necessary preservation of integuments only.

You next divide the muscles obliquely, and carefully finish the remaining part of the operation in the usual manner: very seldom more than three arteries here, require the use of the ligature.

The callico roller need only be applied upon the upper part of, and round the knee, as well as below, carrying it near to the edge of the wound, and just sufficiently retentive to prevent a retraction of the integuments.

F

The

The relaxed side posture of the patient's body, with the flexed position of the knee after this operation, manifest the great advantages thereunto belonging in a most conspicuous manner, by instantaneously disposing all the soft parts of the wound to assume that friendly oval-like appearance, so aptly calculated for their immediate nice approximation and adaption.

Of the LONG STUMP.

AFTER the same manner, may the long stump (as it is called) be made, and the like advantages equally attend the cure, when the above directions are observed.

But here I must remark, that this operation must not take place so low
down

Different Parts of the Extremities. 83

down in the limb, as is usual in the flap operation, but at such part of the leg, that the secondary incision may pass through muscular, and not tendinous substances, for then, the cure proceeds in the mildest manner, and every advantage that can be wished for, accomplished, respecting the free use of the knee joint: no muscular cushion, so studiously intended by the flap operation, I am convinced, can here ever be wanted; since the pressure of the body in walking, in all those cases which have come to my knowledge, is invariably made upon the upper part of the machine.

Of the ARM and FOREARM.

THE Amputation of the arm and forearm, may be performed similar to that of the thigh and leg.

Of the FINGERS and TOES.

BUT in Amputations of the fingers and toes, and especially of the fingers, I must beg leave to depart from the general established mode.

From the daily use of weighty stamps, in a variety of the different manufactures of Birmingham, in order to give impressions to different metals, a great number of boys and men are employed to lay in (as it is termed) the various articles, which employment, consequently, subjects them frequently to the accident of having a part of one or more of their fingers (literally speaking) mashed to pieces.

In such cases, wherever there appears a possibility of the contused soft parts,
and

Different Parts of the Extremities. 85

and fractured bones (after the process of digestion shall have taken place) forming an union again, I invariably give nature that chance, and assist her with all the attention possible, well knowing her powers to be capable of doing wonders, if not too much interrupted.

But in the worst cases, where not the least shadow of a possibility can vindicate such an attempt, if the injury borders upon a joint, and sound soft parts appear to remain, sufficient to be brought into easy contact afterwards, I separate the finger at that joint; but if the violence extends above a joint, I studiously remove not the least part of the phalanx further up, than what is just sufficient to bring the lips of the wound into artful contact, shortening the finger as little as possible; being perfectly sensible of the great use, in a variety,

riety of circumstances, of even a small portion of an internode of a finger, remaining beyond a joint, and much more so then, must it be with that of a thumb.

As these patients are generally young subjects, and the phalanges of their fingers consequently not very compact; in such cases, I pinch off each bone, at one stroke, with a strong pair of sharp nippers, instead of making use of the metacarpal saw.

No exfoliation ever once attended the cure, conducted upon these principles, although one of my patients was upwards of thirty-five years old; for by immediately, and artfully covering the extremity of the bone, or cartilage with the soft parts, by forming their lips into
a trans-

Different Parts of the Extremities. 87

a transverse line, &c. a speedy and perfect union constantly followed.

A moderate pressure continued for a little while with a finger upon each bleeding artery, sufficiently secures the hæmorrhage in these parts.

In the course of my practice, I have treated upwards of twenty cases agreeable to the above method, and their cures have been completed in the space of from one, to three weeks.

Of the Extirpation of diseased Tumors, &c.

HAVING observed, in the foregoing pages, that the practice therein enforced, had been successfully applied, not only to Amputations of different parts of the extremities, but to the extirpation of various

various species of diseased tumors; I must here, therefore remark, that in the course of my practice, I have extirpated, and cured, several enlarged lymphatic, commonly called scrofulous glands, situated in different parts of the neck; scirrhus and cancerous tumors, seated in the breasts, and in other parts of the body; steatomatous tumors, &c. one of which last named tumors, when removed from the upper part of the arm, and the adjacent parts of an emaciated, and aged woman, weighed eleven pounds; and although at the edge of its integuments, where it had been separated from the body, upon turning the tumor upside down, it formed a circular appearance, whose diameter measured full seven inches, yet by a careful dissection of the integuments (which in this case were remarkably thin) all round, from the sides of the basis of the tumor, directed by a
line

line drawn with a pen and ink, for that purpose, so much of them were preserved, after the operation was finished, as to approach pretty nearly into contact; the preserved lip all round, was immediately very carefully expanded, and properly applied in contact with the external surface of the different parts of muscles, which were exposed by the operation; and the small remains of the wound were covered with a pledgit spread with a mild cerate; the lip of expanded integuments, and pledgit thus applied, were artfully retained by slips of sticking plaister, and a very lightly compressive bandage; placing the patient properly in bed, with injunctions of strictly attending to the lax position of muscles; by which means the whole lip immediately united, and by dressing the small fore superficially, a complete cure was obtained in thirty-three days, the cicatrix being
so

so small, as might be entirely covered with a half crown piece.

In the extirpation of tumors of a small size, as alluded to above, agreeable to the universally established doctrine, by making a simple incision through the integuments, the length of the tumors, and in those of a larger size, two semilunar incisions through the anterior part of of them, each tumor was easily removed; the lips of the wounds were then immediately brought into contact, and by pursuing the above mode of after-treatment, the cures were all very speedily obtained; some of them within the space of ten days or a fortnight.

And does not daily experience, in accidental incised, or lacerated wounds with flaps, especially in those of the hairy scalp, clearly prove, with what facility,
nature,

nature, when properly assisted, unites divided parts by the first intention?

To the serious attention, therefore, of every candid practiser in surgery, in a great variety of operations, as well as in all other cases, which will properly admit of it, I cannot be too solicitous in recommending the use of the above recited plan, to accomplish that most desirable effect, viz. the union of divided parts by the first intention, so beneficial to the patient, and so satisfactory to the humane practitioner.

F I N I S.

THE [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]